

UNDERWATER BRIDGE INSPECTION REPORT

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STRUCTURE NO. 70532

CSAH NO. 9

OVER THE

MINNESOTA RIVER

METRO DISTRICT – SCOTT COUNTY

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SEPTEMBER 14, 2012

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

AND

WSB & ASSOCIATES, INC.

JOB NO. 2107

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge 70532, Piers 1 and 2, were in good condition with no defects of structural significance observed. A heavy accumulation of timber debris was observed at Pier 2. Partial footing exposure with up to 5 feet vertical exposure was observed at Pier 1.

INSPECTION FINDINGS:

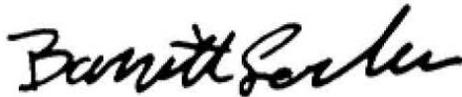
- (A) A heavy accumulation of timber debris consisting of logs and branches 18 inches in diameter and smaller was observed around the entire perimeter of Pier 2, extending up to 10 feet off the upstream nose and faces, and from the channel bottom to 7 feet above the waterline.
- (B) A moderate accumulation of timber debris, consisting of up to 12 inch diameter and smaller pieces was observed at the upstream nose of Pier 1 extending up to 5 feet off the pier nose and from the channel bottom to the waterline.
- (C) Footing exposure was observed at the upstream nose and along the entire north face of Pier 1 with a maximum vertical exposure of 5 feet near the midpoint of the pier.

RECOMMENDATIONS:

- (A) Remove the timber debris during future maintenance operations.
- (B) Consider scour countermeasures at Pier 1 to inhibit any further exposure and/or undermining of the pier foundations. Scour analysis should be performed.
- (C) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months. Until scour countermeasures are installed at Pier 1, the bridge should be inspected underwater during or after a significant flood event.

Inspection Team Leader:

WSB and Associates



Barritt Lovelace  
Registered Professional Engineer  
Bridge Safety Inspection Team Leader

Respectfully submitted,

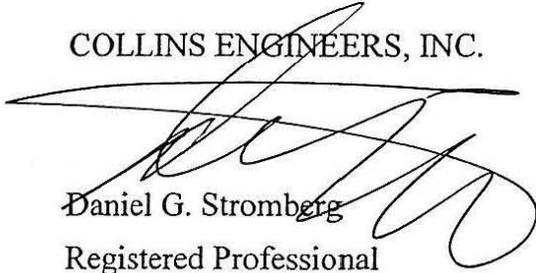
PROFESSIONAL ENGINEER

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/14 License # 21491

COLLINS ENGINEERS, INC.



Daniel G. Stromberg

Registered Professional  
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION  
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 70532

Feature Crossed: Minnesota River

Feature Carried: CSAH No. 9

Location: Metro District – Scott County

Bridge Description: The superstructure consists of four spans of multiple concrete beams supporting a reinforced concrete deck. The superstructure is supported by two concrete abutments and three concrete piers. The piers are numbered 1 through 3 from south to north.

2. INSPECTION DATA

Professional Engineer/Team Leader: Barritt Lovelace, P.E.

Dive Team: Kasey Yoder (WSB), Lukas Janulis (Collins)

Date: September 14, 2012

Weather Conditions: Sunny, 55°F

Underwater Visibility: 1.0 foot

Waterway Velocity: None/Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2

General Shape: The piers each consist of an oblong rectangular concrete shaft supporting a hammerhead pier cap on top of a rectangular footing founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 11.8 feet.

4. WATERLINE DATUM

Water Level Reference: The bottom of the pier cap on the downstream end of Pier 1.

Water Surface: The waterline was approximately 21.9 feet below reference.  
Waterline Elevation = 693.7

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 5

Item 92B: Underwater Inspection: Code B/09/12

Item 113: Scour Critical Bridges: Code N/07

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

       Yes   X   No

6. STRUCTURAL ELEMENT CONDITION RATING

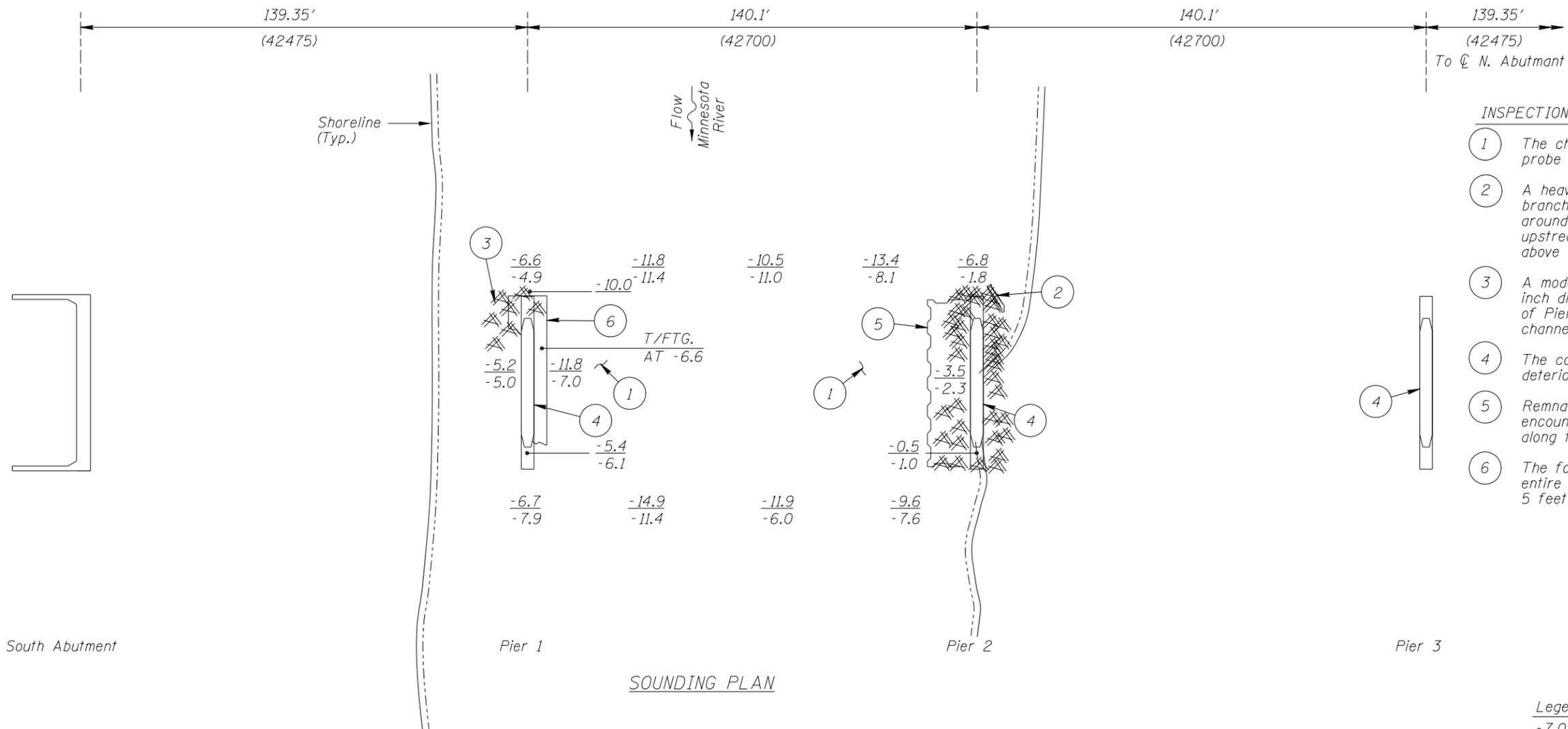
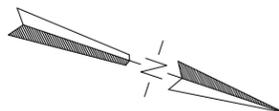
Item #	Element Description	Quantity	Unit	Conditions				
				1	2	3	4	5
210	Reinforced Concrete Pier Wall	40	LF	40				
361	Scour	1	EA	1				
985	Slopes & Slope Protection	1	EA	1				



Photograph 1. View of Pier 1 and Timber Debris, Looking Northwest.



Photograph 2. View of Pier 2, Looking Northwest.

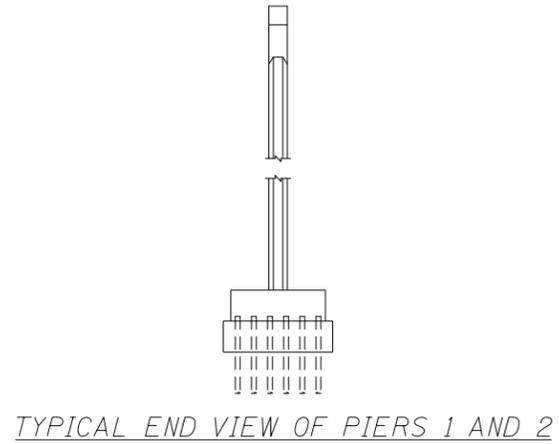


- INSPECTION NOTES:**
- 1 The channel bottom consisted of firm silty clay with a maximum probe rod penetration of 3 inches.
  - 2 A heavy accumulation of timber debris consisting of logs and branches 18 inches in diameter and smaller was observed around the entire perimeter of Pier 2 extending 10 feet off the upstream nose and faces and from the channel bottom to 7 feet above the waterline.
  - 3 A moderate accumulation of timber debris, consisting of up to 12 inch diameter drift pieces, was observed at the upstream nose of Pier 1, extending up to 5 feet off the pier nose and from the channel bottom to the waterline.
  - 4 The concrete was smooth and sound with no notable defects or deterioration.
  - 5 Remnants of a old abandoned sheet pile cofferdam were encountered extending 2 to 3 feet up out of the channel bottom along the south face of pier 2.
  - 6 The footing was exposed at the upstream nose and along the entire north face of Pier 1 with a maximum vertical exposure of 5 feet near the midpoint of the pier.

**SOUNDING PLAN**

- Legend**
- 7.0 Sounding Depth (9/14/12)
  - 7.0 Sounding Depth (11/19/07)
  - Timber Debris
  - (42475) Indicates Metric Equivalent per Design Plans (In millimeters, U.N.O.)

- GENERAL NOTES:**
- 1 Piers 1 and 2 were inspected underwater.
  - 2 At the time of inspection on September 14, 2012, the waterline was located approximately 21.9 feet below bottom of hammerhead pier cap at the downstream end of Pier 1. This corresponds with a waterline elevation of 693.7 feet based on design drawings.
  - 3 Soundings indicate the water depth at the time of the inspection and are measured in feet.
  - 4 Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

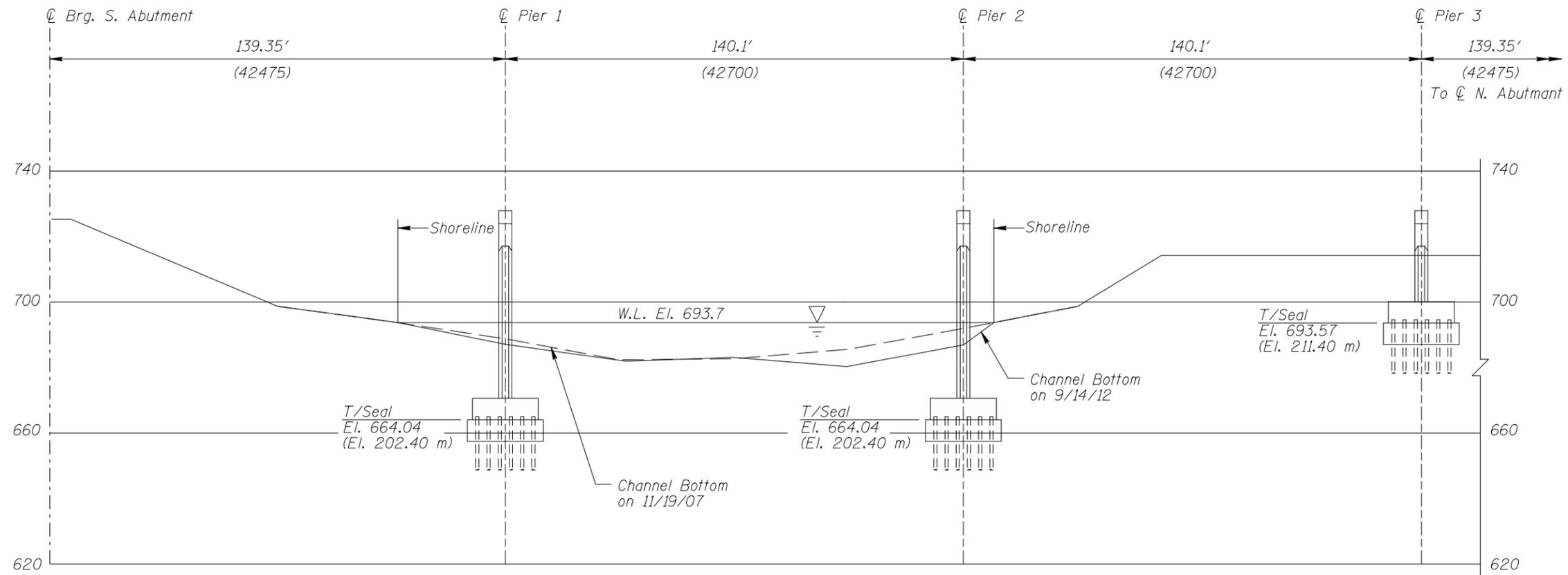


<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 70532 OVER THE MINNESOTA RIVER METRO DISTRICT, SCOTT COUNTY		
<b>INSPECTION AND SOUNDING PLAN</b>		
Drawn By: BJR	<b>COLLINS ENGINEERS</b>	Date: SEP. 2012
Checked By: BRL		Scale: NTS
Code: 522170532		Figure No.: 1

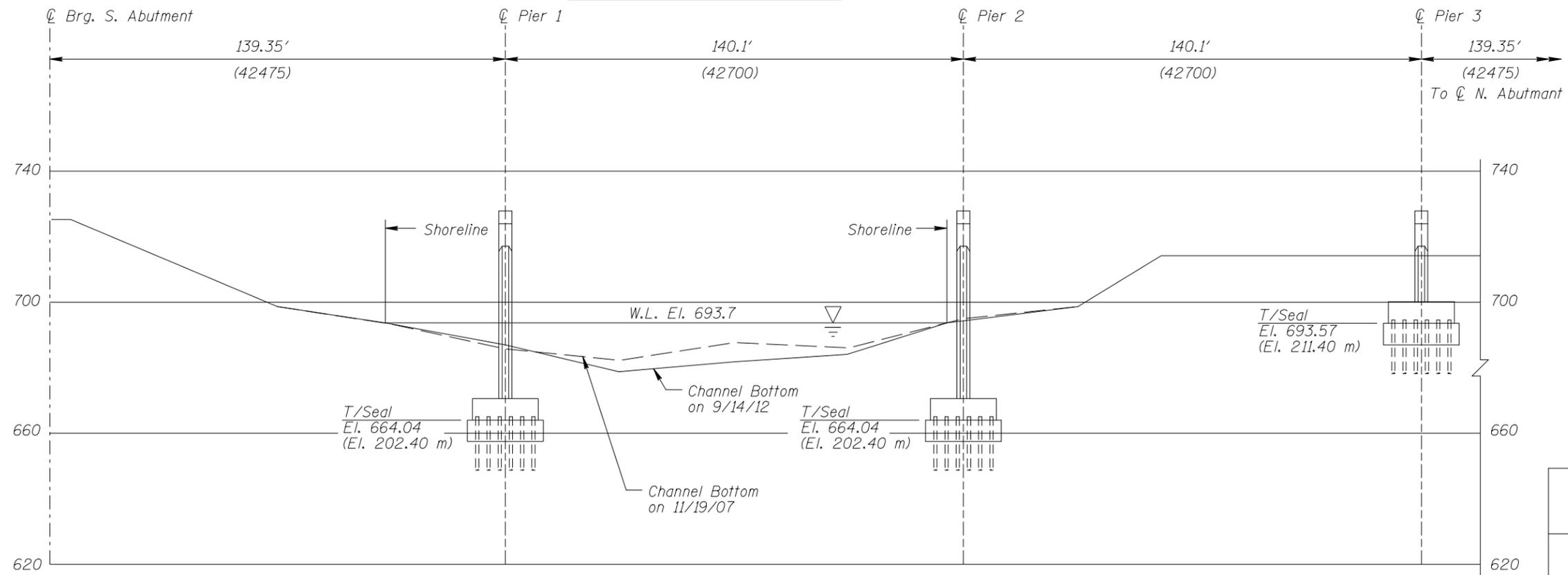
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UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:  
Refer to Figure 1 for General Notes.



<b>MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION</b>		
STRUCTURE NO. 70532 OVER THE MINNESOTA RIVER DISTRICT M, SCOTT COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: BJR	<b>COLLINS ENGINEERS</b>	Date: SEP. 2012
Checked By: BRL		Scale: 1"=40'
Code: 522170532		Figure No.: 2

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MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF BRIDGES AND STRUCTURES  
DAILY DIVING REPORT

INSPECTORS: WSB & Associates and Collins Engineers      DATE: September 14, 2012

ON-SITE TEAM LEADER: Barritt Lovelace, P.E.

BRIDGE NO: 70532      WEATHER: Sunny, 55°F

WATERWAY CROSSED: Minnesota River

DIVING OPERATION:  SCUBA       SURFACE SUPPLIED AIR  
 OTHER

PERSONNEL: Kasey Yoder (WSB), Lukas Janulis (Collins)

EQUIPMENT: Commercial Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod,  
Camera

TIME IN WATER: 9:15 a.m.

TIME OUT OF WATER: 9:50 a.m.

WATERWAY DATA: VELOCITY Negligible

VISIBILITY 1.0 foot

DEPTH 11.8 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: The concrete of both piers was smooth, sound, and in good condition. Moderate to heavy accumulations of timber debris were observed at Piers 1 and 2. Significant footing exposure has developed since the last underwater inspection (not exposed in 2007). The footing was exposed at the upstream nose and along the north face of Pier 1 with up to 5 feet of maximum vertical exposure. No foundation undermining was encountered.

FURTHER ACTION NEEDED:       YES       NO

Consider placement of scour countermeasures to inhibit any further foundation exposure at Pier 1. Considerations should also be given to performing scour analysis of the bridge.

Consider removing the timber debris during future maintenance operations.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of sixty (60) months. Until scour countermeasures are installed at Pier 1, the bridge should be inspected underwater during or after a significant flood event.

MINNESOTA DEPARTMENT OF TRANSPORTATION  
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 70532  
 INSPECTORS WSB & Associates and Collins Engineers, Inc.  
 ON-SITE TEAM LEADER Barritt Lovelace P.E.  
 WATERWAY CROSSED Minnesota River

INSPECTION DATE September 14, 2012  
 NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	10.0'	N	7	7	8	N	7	5	7	8	6	5	7	N	N	N	N	N
	Pier 2	3.5'	N	7	N	8	N	7	7	7	8	5	5	7	N	N	N	N	N

\*UNDERWATER PORTION ONLY

REMARKS: The concrete of both piers was smooth, sound, and in good condition. Moderate to heavy accumulations of timber debris were observed at Piers 1 and 2. Significant footing exposure has developed since the last underwater inspection (not exposed in 2007). The footing was exposed at the upstream nose and along the north face of Pier 1 with up to 5 feet of maximum vertical exposure. No foundation undermining was encountered.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO. USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.